

TECHNICAL GUIDE

CAL. Y468A

CAL. Y469A

ANALOGUE QUARTZ

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I. SPECIFICATIONS

Cal. No.		Y467A	Y468A	Y469A
Item				
Time indication		3 hands	3 hands	3 hands
Additional mechanism	Date	○	○	—
	Day	—	○	—
	Bilingual change-over system for the day of the week	—	○	—
	Instant day setting device	—	○	—
	Instant date setting device	○	○	—
	Second setting device (Stops at every second)	○	○	○
	Electronic circuit reset switch	○	○	○
Crystal oscillator	32,768 Hz (Hz = Hertz Cycle per second)			
Loss/gain	Loss/gain at normal temperature Monthly rate: less than 15 seconds (Annual rate: less than 3 minutes)			
Casing diameter	φ17.6 mm (16.00 mm between 3 o'clock and 9 o'clock sides)			
Height (excluding battery portion)	3.3 mm	3.6 mm	3.1 mm	
Operational temperature range	-10°C ~ +60°C (14°F ~ 140°F)			
Driving system	Step motor system (2 poles)			
Regulation system	Trimmer condenser			
Battery power	<ul style="list-style-type: none"> ● Maxell SR726SW Silver oxide battery ● TR726SW Silver peroxide battery Battery life: Approx. 2 years Voltage: 1.55V 			
Jewel	2 jewels			

II. DISASSEMBLING, REASSEMBLING AND LUBRICATING (Cal. Y468A)

● Disassembling and reassembling

Disassembling procedures Figs. ① ~ ④⑦

Reassembling procedures Figs. ④⑦ ~ ①

● Lubricating

Types of oil

● Moebius A

○ Elgin oil

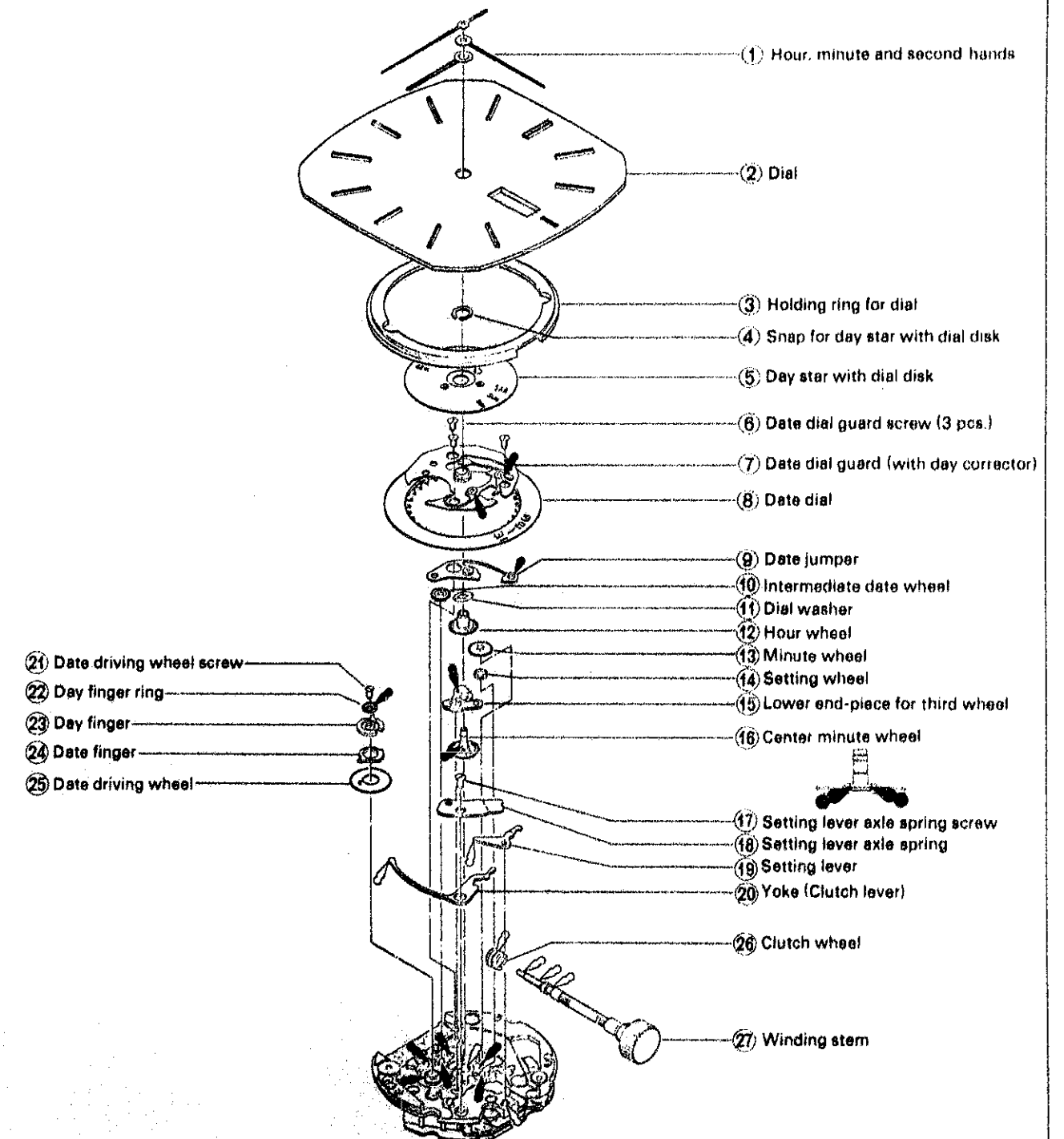
Oil quantity

● Liberal

● Normal

● Extremely small

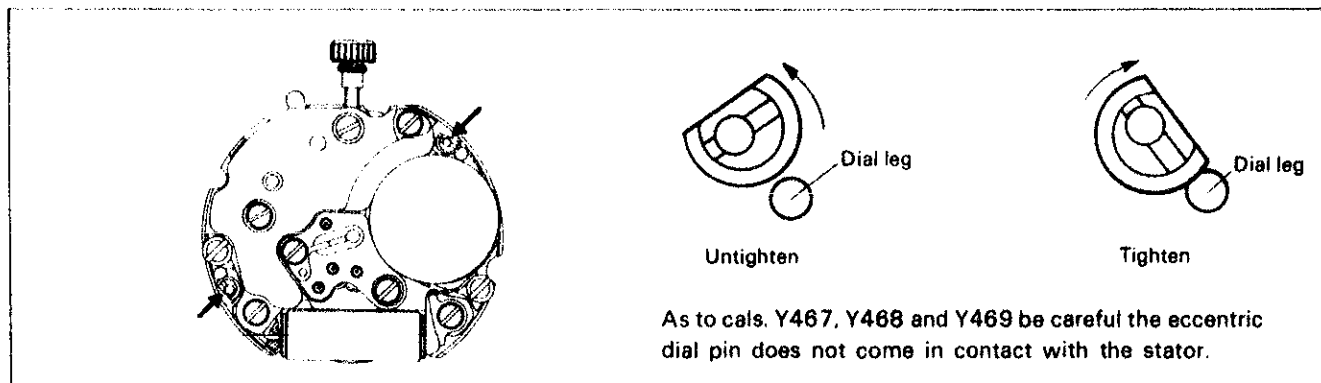
(1) Calendar and setting mechanism



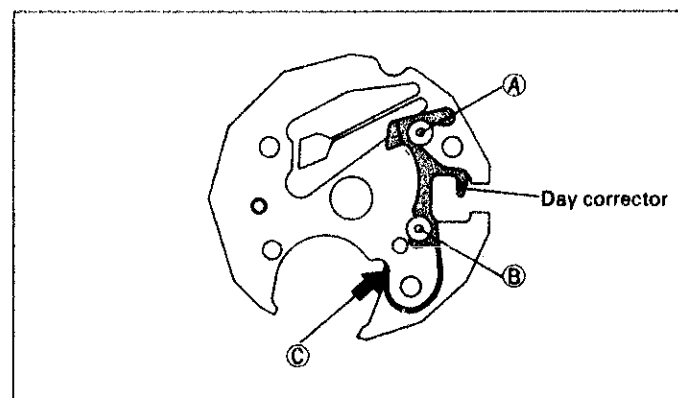
Remarks for disassembling and reassembling

- How to disassemble and reassemble the hands ①.
When disassembling or reassembling, always pull the crown out to the second click position. The second hand must be placed just in line with a second mark. (Either odd or even second mark will do.)
- How to disassemble and reassemble the dial ②.
After turning the eccentric dial pin between 90° and 150°, it is possible to remove and replace the dial.

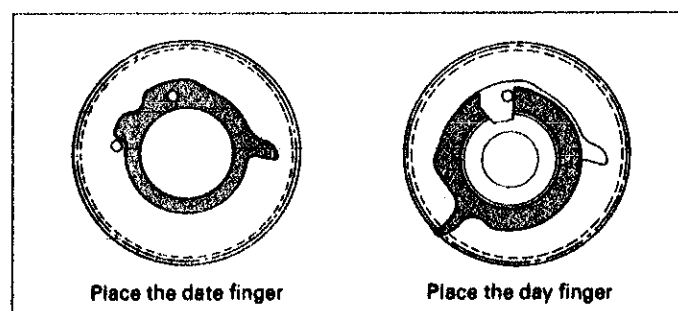
How to turn the eccentric dial pin



- Date dial guard ⑦
Handle the day corrector together with the date dial guard except when its replacement is required.
- How to reassemble the day corrector
 1. Hook the day corrector on the pins for the date dial guard in the order of A and B.
 2. Place the day corrector spring portion C (arrow-marked) under the backside of the date dial guard.

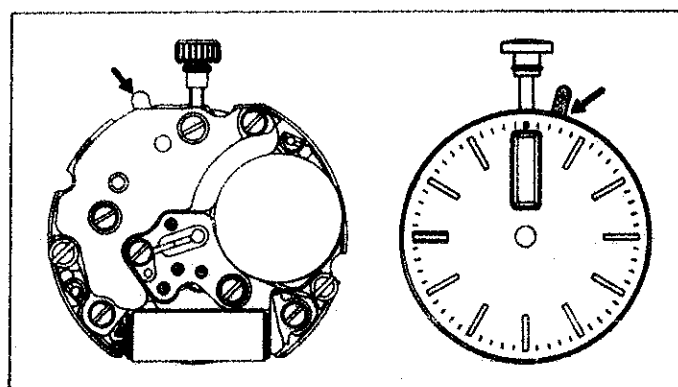


- How to reassemble the date finger and the day finger ⑳, ㉑

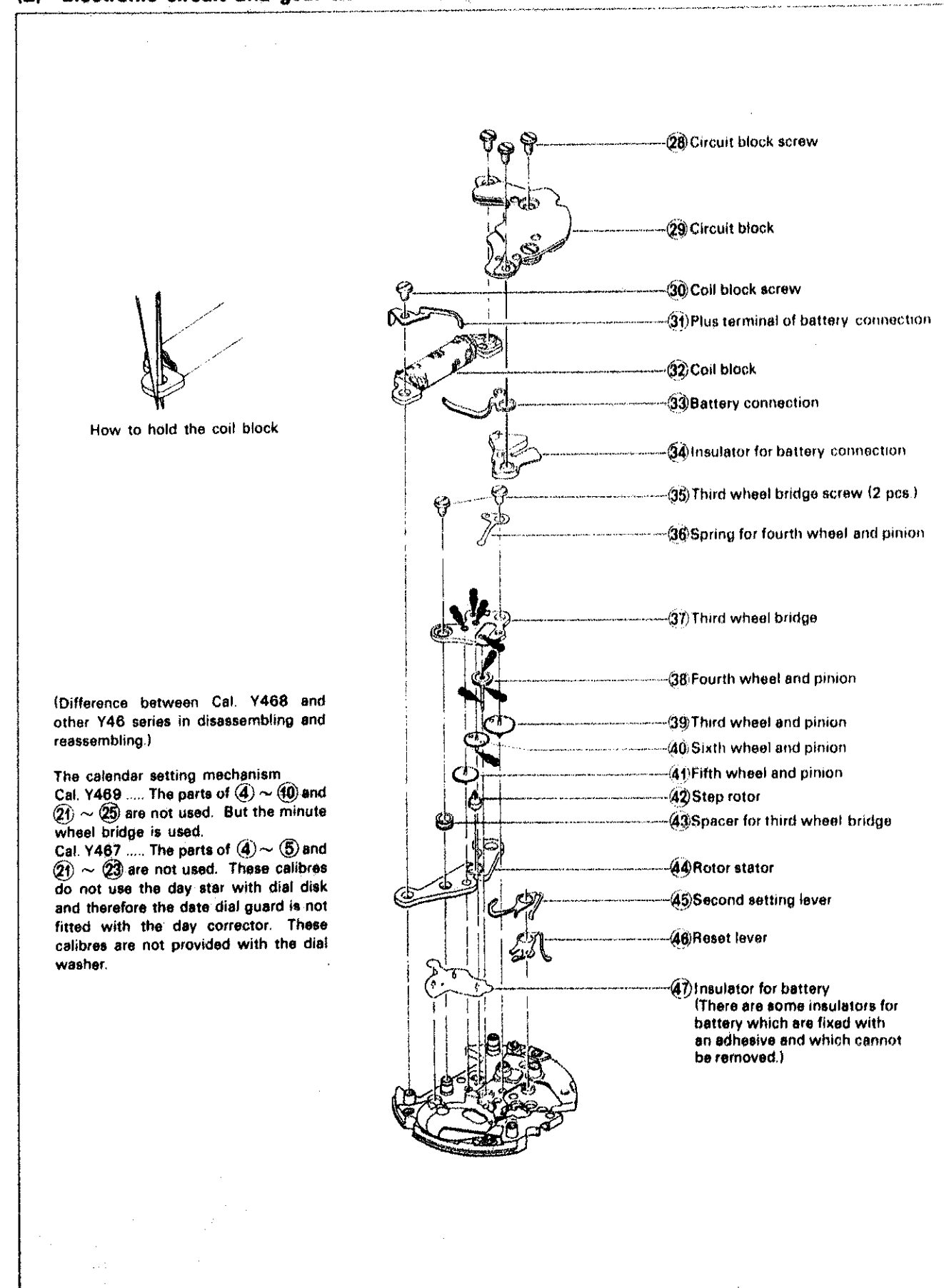


- How to remove the winding stem ㉗

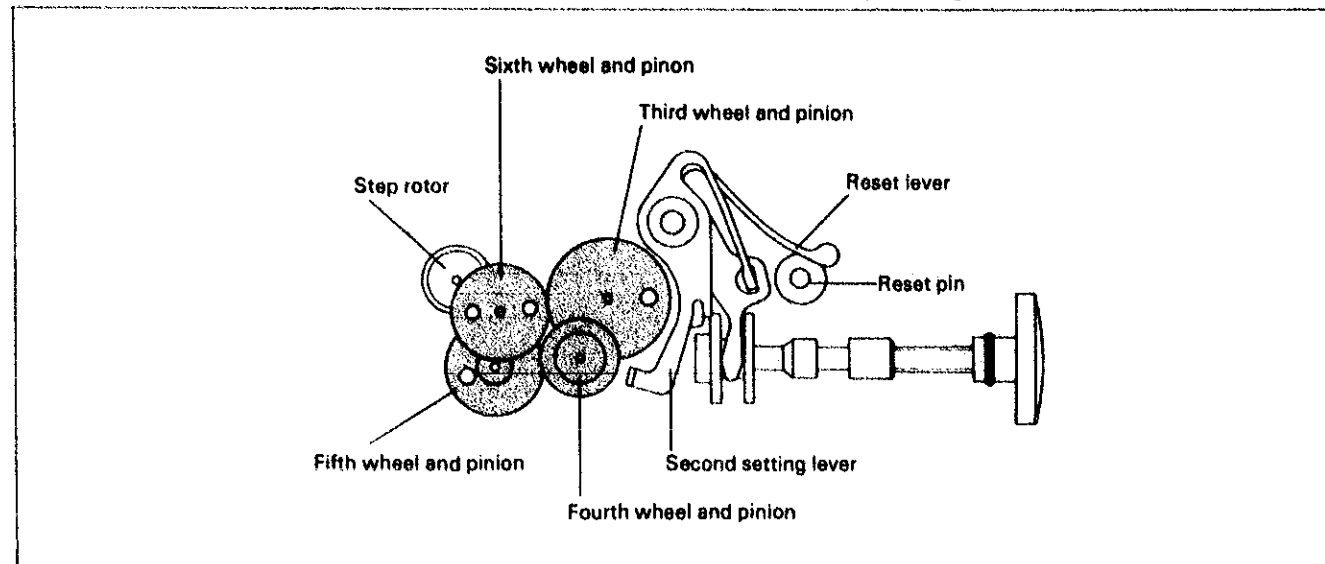
- From the circuit block side
A part of the setting lever is seen at the outer circumference of the main plate (arrow-marked). Push it down to removed the winding stem.
- From the dial side
A part of the lever for unlocking stem is seen at the outer circumference of the dial. Push it down to remove the winding stem.



(2) Electronic circuit and gear train mechanism



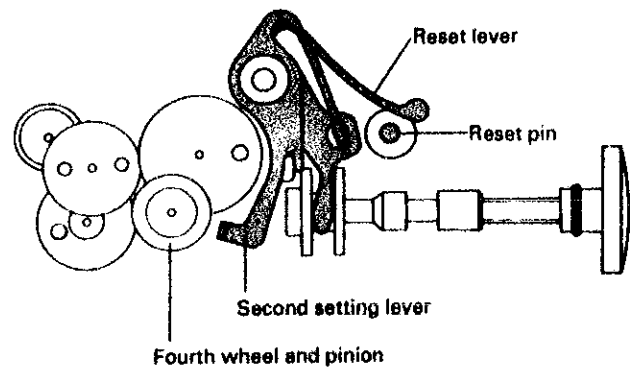
● How to reassemble the gear train, reset lever and second setting lever 39 ~ 46



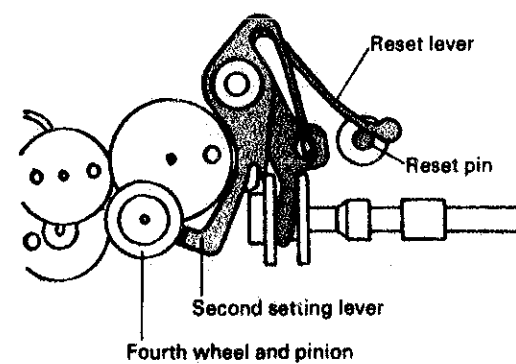
● Functions of the gear train, reset lever and second setting lever 39 ~ 46

● When the crown is pulled out to the second click position, make sure that the second setting lever sets securely the fourth wheel and pinion and at the same time the reset lever touches the reset pin.

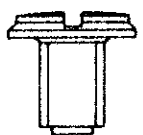
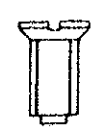
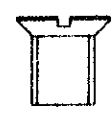
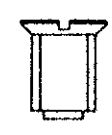
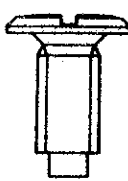
● Normal and first click positions of the crown



● Second click position of the crown

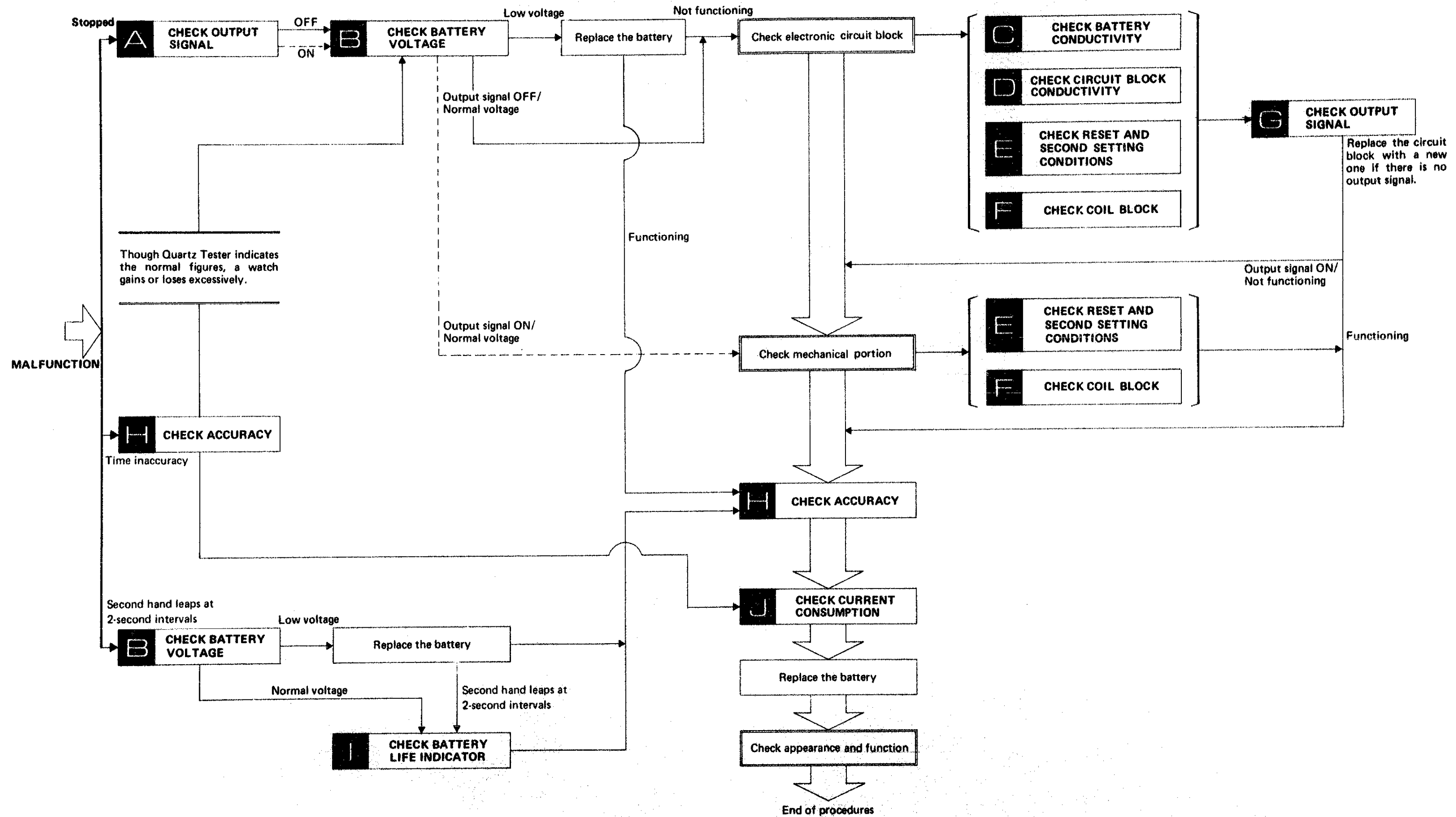


● List of screws used

				
<p>Third wheel bridge screw Coil block screw</p>	<p>Date driving wheel screw</p>	<p>Setting lever axle spring screw Screw for dial holding ring</p>	<p>Date dial guard screw</p>	<p>Circuit block screw</p>

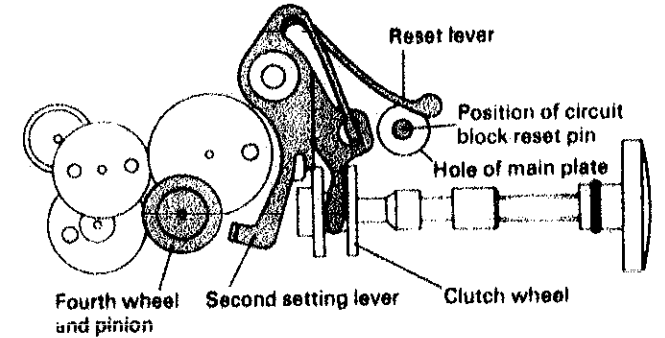








III. CHECKING AND ADJUSTMENT





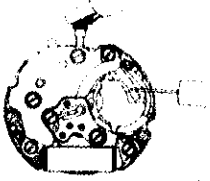


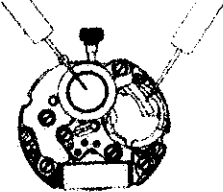
(1) Guide table for checking and adjustment



(2) Procedures for checking and adjustment

	Procedures	Results	Adjustment and Repair
CHECK OUTPUT SIGNAL	<p>Check output signal</p>	<p>One-second blinking</p> <p>No one-second blinking</p>	<p>Proceed to [1]</p> <p>Proceed to [2]</p>
CHECK BATTERY VOLTAGE	<p>Check battery voltage</p>	<p>More than 1.55V</p> <p>Less than 1.55V</p>	<p>In procedure [A] if one-second blinking is found, proceed to Check mechanical portion.</p> <p>In procedure [A] if one-second blinking is not found, proceed to Check electronic circuit block.</p> <p>Proceed to Replace the battery.</p> <p>If a watch operates after battery replacement, proceed to [1].</p> <p>If a watch does not operate after battery replacement, proceed to Check electronic circuit block.</p>
CHECK BATTERY CONDUCTIVITY	<p>Check battery conductivity</p> <p>1. Make sure that the coil block screw is tightened firmly.</p> <p>2. Check for any contamination on the connecting portion of battery, the battery connection, the plus terminal of battery connection and holding spring for battery.</p>	<p>No loosened screw</p> <p>Loosened screw</p> <p>Uncontaminate</p> <p>Contaminated</p>	<p>Proceed to [2].</p> <p>Retighten the screws.</p> <p>Proceed to [1].</p> <p>Wipe off carefully.</p>
CHECK CIRCUIT BLOCK CONDUCTIVITY	<p>Check circuit block conductivity</p> <p>1. Check to see if the circuit block screws (3 pcs.) are tightened firmly.</p> <p>2. Check the circuit block for any break in the welded portion, short circuit, pattern break and contamination.</p>	<p>No loosened screw</p> <p>Loosened screw</p> <p>No break in the welded portion, short circuit, pattern break, or contamination.</p> <p>Break in the welded portion, short circuit, pattern break.</p> <p>Contaminated</p>	<p>Proceed to [2].</p> <p>Retighten the screw.</p> <p>Proceed to [1].</p> <p>Replace the circuit block.</p> <p>Wipe off carefully.</p>

	Procedures	Results	Adjustment and Repair
CHECK RESET AND SECOND SETTING CONDITIONS	<p>Check reset and second setting conditions</p> <p>1. Check to see if the second hand stops immediately after the crown is pulled out to the second click position and if it starts promptly one second after the crown is pushed in to the normal position.</p> <p>2. Check for the clearance between the reset lever and the reset pin (with the circuit block removed).</p>	<p>Stops completely and starts after one second.</p> <p>Does not stop or moves irregularly.</p>	<p>Proceed to [1].</p> <p>Proceed to [2].</p>
	<p>(1) Crown position: Normal, first click</p>		
	<p>(2) Crown position: Second click</p>		<p>Proceed to [2]. (2)</p>
	<p>(2) Crown position: Second click</p>		<p>Replace the reset lever.</p>
	<p>(2) Crown position: Second click</p>		<p>Proceed to [3].</p>
	<p>(2) Crown position: Second click</p>		<p>Replace the reset lever.</p>
	<p>3. Check for the clearance between the second setting lever and the fourth wheel and pinion (with the circuit block removed).</p>		<p>Proceed to [3]. (2)</p>
	<p>(1) Crown position: Normal, first click</p>		<p>Replace the second setting lever.</p>
	<p>(2) Crown position: Second click</p>		<p>Proceed to [1].</p>
	<p>(2) Crown position: Second click</p>		<p>Replace the second setting lever.</p>

	Procedures	Results	Adjustment and Repair
CHECK COIL BLOCK	Check coil block 	2.0kΩ ~ 4.0kΩ Less than 2.0kΩ Short circuit More than 4.0kΩ Broken coil wire	Check Electronic Circuit Block is being checked. Proceed to  Check Mechanical Portion is being checked. Proceed to  Replace the coil block.
CHECK FOR OUTPUT SIGNAL	Check for output signal	One-second blinking No one-second blinking	Functioning Proceed to  Not functioning Proceed to Check mechanical portion . Replace the circuit block.
CHECK ACCURACY	Check accuracy	Normal Defective	Replace the battery. Adjust time accuracy.
CHECK BATTERY LIFE INDICATOR	Check battery life indicator Set up the Micro Test Clip red ⊕: Crown or winding stem Probe black ⊖: Battery connection 1. Set the voltage at 1.25V Check if the second hand moves at 2-second intervals.  2. Set the voltage at 1.55V Check if the second hand moves at 1-second intervals.	The second hand moves at 2-second intervals. The second hand moves at 1-second intervals. The second hand moves at 1-second intervals. The second hand moves at 2-second intervals.	Proceed to  2. Replace the circuit block. Proceed to  Replace the circuit block.
CHECK CURRENT CONSUMPTION	Check current consumption Place the battery on the third wheel bridge with its ⊖ surface faced up. Probe red ⊕: Battery connection Probe black ⊖: Battery surface ⊖ 	Less than 1.7μA More than 1.7μA Note: If the pointer of the Volt-ohm-meter scales out and the current consumption cannot be measured, reset its range, e.g. at DC 30mA. Next, when the pointer is stabilized with the probes of the Volt-ohm-meter shown in the left illustration, return the range to DC 12μA (or DC 0.03mA) and read the value indicated. ● The value of current consumption of the Cal. Y46 series is the same as that of Cal. Y468.	Normal Proceed to Check electronic circuit block .

All procedures of Disassembling, Reassembling, Checking and Adjustment are completed.

PARTS LIST

ANALOGUE QUARTZ

Cal. Y468A

Characteristics

Casing diameter: φ 17.6 mm
 Maximum height: 3.5 mm without battery
 Jewels: 2 j
 Frequency of quartz crystal oscillator: 32,768 Hz (Hz=Hertz Cycle per second)
 Driving system: Step motor system (2 poles)
 Regulation system: Trimmer condenser
 Second setting device .
 Calendar (Day & Date)
 Instant setting device for day & date calendar
 Bilingual change-over system for day of the week

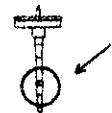
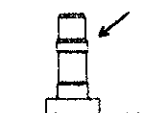

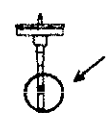
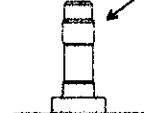

PART NO.	PART NAME	PART NO.	PART NAME
131 468	Third wheel bridge	4242 260	Plus terminal of battery connection
231 260	Third wheel & pinion	4270 260	Battery connection
☆241 260	Fourth wheel & pinion (4.54 mm)	4455 260	Reset lever
☆241 264	Fourth wheel & pinion (4.81 mm)	011 409	Upper hole jewel for step rotor
261 260	Minute wheel	011 409	Lower hole jewel for step rotor
☆270 260	Center minute wheel with cannon pinion (2.58 mm)	012 151	Third wheel bridge screw
☆270 264	Center minute wheel with cannon pinion (2.85 mm)	012 151	Coil block screw (Screw for plus terminal of battery connection)
☆271 269	Hour wheel (1.89 mm)	012 459	Case screw
☆271 270	Hour wheel (1.91 mm)	012 462	Circuit block screw
281 260	Setting wheel	012 768	Setting lever axle spring screw
282 260	Clutch wheel	012 770	Date driving wheel screw
☆354 260	Winding stem (13.85 mm)	012 781	Date dial guard with day corrector screw
☆354 262	Winding stem (19.55 mm)	017 125	Tube for circuit block A
372 260	Joint stem (movement portion)	017 126	Tube for circuit block B
373 250	Joint stem (case portion)	017 127	Tube for circuit block C
☆383 260	Setting lever	017 128	Second setting lever pin
☆383 265		017 129	Tube for third wheel bridge screw A
384 260	Yoke (Clutch lever)	017 130	Tube for third wheel bridge screw B
389 260	Setting lever axle spring	017 131	Tube for coil block screw
391 260	Second setting lever	017 936	Eccentric dial pin
436 260	Lower end-piece for third wheel	☆TR726SW	Silver peroxide battery
☆470 - -	Day star with dial disk	☆Maxell SR726SW	Silver oxide battery
491 180	Dial washer		
495 260	Spacer for third wheel bridge		
499 260	Day finger ring		
556 260	Date finger		
560 260	Friction spring for fourth wheel & pinion		
701 260	Fifth wheel & pinion		
706 260	Sixth wheel & pinion		
719 260	Day corrector		
801 260	Date dial		
802 260	Date driving wheel		
808 260	Date dial guard		
810 260	Date jumper		
817 260	Intermediate date wheel		
868 260	Day finger		
☆884 260	Holding ring for dial		
963 260	Snap for day star with dial disk		
4001 469	Circuit block		
☆4002 261	Coil block		
4146 260	Step rotor		
4216 260	Insulator for battery		
4219 260	Insulator for battery connection		
4239 260	Rotor stator		

☆ ⊕ Please see remarks on the reverse page.

Cal. Y468A

Remarks :

Fourth wheel & pinion, Center minute wheel with cannon pinion, and Hour wheel.
There are two different types as specified below.
Combination:

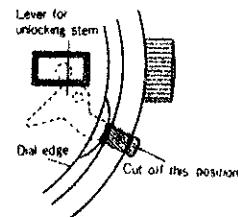
Type	Fourth wheel & pinion	Center minute wheel with cannon pinion	Hour wheel
a	 ☆241 260	 ☆270 260	 ☆271 269
b	 ☆241 264	 ☆270 264	 ☆271 270

Winding stem

- ☆354 260..... Short winding stem (Thread is provided completely on the crown portion.)
- ☆354 262..... Long winding stem (Thread is provided only on the end of the crown portion.)

Setting lever

- ☆383 260 } There are two types of setting lever. 383 260 can be used as it is. 383 265 can be used by cutting its tail. The size of a setting lever is determined based on the design of cases.
 - ☆383 265 }
- When adjusting the length of the setting lever by cutting its tail, be sure that the tail partly comes out of the dial as shown in the illustration. If the tail is hidden from view by the dial, it will be difficult to disassemble the winding stem.



Day star with dial disk

- 470 043(English-Spanish, Black figures on white background)
- 470 044(English-French, Black figures on white background)
- 470 046(English-Italian, Black figures on white background)
- 470 264(English-Roman figures, Black figures on white background)
- 470 049(English-Arabic, Black, figures on white background)
- 470 045(English-German, Black figures on white background)
- 470 050(English-Persian, Black figures on white background)
- 470 260(English-Japanese, Black figures on white background)

Holding ring for dial

- ☆884 260.....The type of a holding ring for dial is determined based on the design of cases and dials.

Coil block

- ☆4002 261.....The parts that have the same parts No. as 4002 261 are interchangeable, even if the color of that parts is different.

Battery

- ☆TR726SW }The applied battery for this calibre might be added the substitutive in the future.
- ☆Maxell SR726SW }

PARTS LIST

ANALOGUE QUARTZ Cal. Y469A

Characteristics

- Casing diameter . ϕ 17.6 mm
- Maximum height : 3.0 mm without battery
- Jewels : 2j
- Frequency of quartz crystal oscillator : 32,768 Hz (Hz=Hertz Cycle per second)
- Driving system : Step motor system (2 poles)
- Regulation system : Trimmer condenser
- Second setting device

PART NO.	PART NAME	PART NO.	PART NAME
131 100	Third wheel bridge	4455 260	Reset lever
231 260	Third wheel & pinion	011 409	Upper hole jewel for step rotor
☆241 263	Fourth wheel & pinion (3.70 mm)	011 409	Lower hole jewel for step rotor
☆241 265	Fourth wheel & pinion (3.80 mm)	012 151	Third wheel bridge screw
☆241 266	Fourth wheel & pinion (4.22 mm)	012 151	Coil block screw (Screw for plus terminal of battery connection)
☆241 267	Fourth wheel & pinion (4.81 mm)	012 459	Case screw
261 260	Minute wheel	012 462	Circuit block screw
☆270 261	Center minute wheel with cannon pinion (2.26 mm)	012 768	Setting lever axle spring screw
☆270 263	Center minute wheel with cannon pinion (1.74 mm)	012 768	Minute wheel bridge screw
☆270 264	Center minute wheel with cannon pinion (2.85 mm)	017 125	Tube for circuit block A
☆270 271	Center minute wheel with cannon pinion (1.84 mm)	017 126	Tube for circuit block B
☆271 262	Hour wheel (0.85 mm)	017 127	Tube for circuit block C
☆271 266	Hour wheel (0.95 mm)	017 131	Tube for coil block screw
☆271 267	Hour wheel (1.37 mm)	017 132	Second setting lever pin
☆271 268	Hour wheel (1.91 mm)	017 149	Tube for third wheel bridge screw A
281 261	Setting wheel	017 159	Tube for third wheel bridge screw B
282 262	Clutch wheel	017 936	Eccentric dial pin
☆354 261	Winding stem (13.13 mm)	☆TR726SW	Silver peroxide battery
☆354 263	Winding stem (18.58 mm)	☆Maxell SR726SW	Silver oxide battery
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☆383 265	Setting lever		
384 261	Yoke (Clutch lever)		
387 261	Minute wheel bridge		
389 260	Setting lever axle spring		
391 260	Second setting lever		
436 261	Lower end-piece for third wheel		
491 260	Dial washer		
493 260	Hour wheel ring (0.03 mm Gold)		
493 261	Hour wheel ring (0.05 mm Silver)		
493 262	Hour wheel ring (0.10 mm Gold)		
495 260	Spacer for third wheel bridge		
560 260	Friction spring for fourth wheel & pinion		
701 260	Fifth wheel & pinion		
706 260	Sixth wheel & pinion		
4001 469	Circuit block		
☆4002 261	Coil block		
4146 260	Step rotor		
4216 260	Insulator for battery		
4219 261	Insulator for battery connection		
4239 260	Rotor Stator		
4242 260	Plus terminal of battery connection		
4270 260	Battery connection		









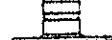



☆ Please see remarks on the reverse page.

Cal. Y469A

Remarks :

Fourth wheel & pinion, Center minute wheel with cannon pinion, Hour wheel.
There are four different types as specified below.

Combination:

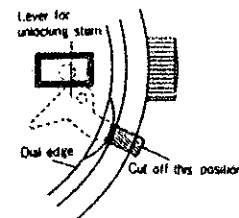
Type	Fourth wheel & pinion	Center minute wheel with cannon pinion	Hour wheel
a	 ☆241 263	 ☆270 263	Silver  ☆271 262
b	 ☆241 265	 ☆270 271	Gold  ☆271 266
c	 ☆241 266	 ☆270 261	Silver  ☆271 267
d	 ☆241 267	 ☆270 264	Silver  ☆271 268

Winding stem

- ☆354 261Short winding stem (Thread is provided completely on the crown portion.)
- ☆354 263Long winding stem (Thread is provided only on the end of the crown portion.)

Setting lever

- ☆383 260 } There are two types of setting lever. 383 260 can be used as it is. 383 265 can be used by cutting its tail. The size of a setting lever is determined based on the design of cases.
 - ☆383 265 }
- When adjusting the length of the setting lever by cutting its tail, be sure that the tail partly comes out of the dial as shown in the illustration. If the tail is hidden from view by the dial, it will be difficult to disassemble the winding stem.



Coil block

- ☆4002 261The parts that have the same parts No. as 4002 261 are interchangeable, even if the color of that parts is different.

Battery

- ☆TR726SW }The applied battery for this calibre might be added the substitutive in the future.
- ☆Maxell SR726SW }